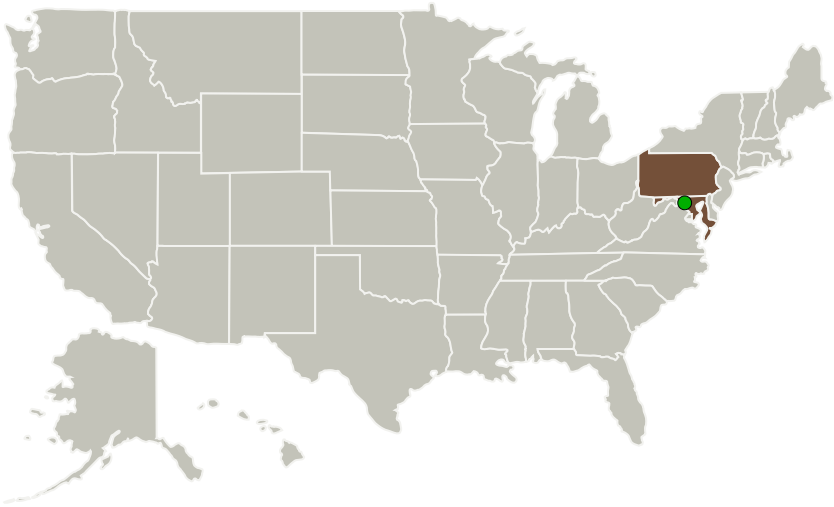
Integrated Composite - Heatpipe Radiator Panel, Phase II

Completed Technology Project (2010 - 2013)

Project Introduction

High performance thermal control technologies are needed to achieve the near term goals of NASA's science spacecraft development programs. High conductivity materials to minimize temperature gradients and provide high efficiency radiators and heat spreader panels are required. Integrated panels that minimize the challenges caused by thermal interfaces, including those of attached heat pipes and cooling loops would provide high performance and high reliability. kTC proposes a general technology development that permits the design of a high performance thermal distribution panel (TDP). The panel will be fabricated with a high conductivity macro-composite skin and in situ heat pipes. This advanced TDP concept will have high conductance that will obviate the need for bulky metal thermal doublers and heat pipe saddles. The conductivity of the proposed material system can be configured to exceed 800 W/mK with a density below 2.5 g/cm3. This material can provide efficient conductive heat transfer between the in situ heat pipes permitting the use of thinner panels further reducing the mass. kTC proved the feasibility of producing the proposed TDP and confirmed by measurements the performance gains the technology affords in the Phase I program. The Phase II work will concentrate on process refinements and scale up.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Thermacore, Inc.	Lead Organization	Industry	Lancaster, Pennsylvania
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Pennsylvania

Project Transitions

March 2010: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139116)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Thermacore, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

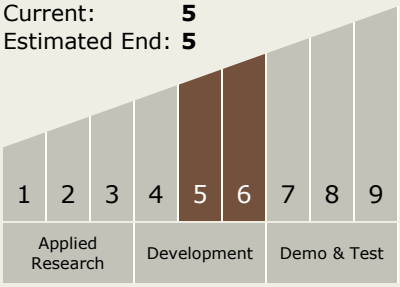
Carlos Torrez

Principal Investigator:

Mark Montesano

Technology Maturity (TRL)

Start: **6**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System